

instances it radiated to the bladder; colic was present in four. Increased urinary frequency was present in all cases. Blood was present macroscopically in two. In all patients the diagnosis was confirmed by X-ray. Five were operated; there was one nephrectomy and four pyelotomies.

Choice of operation in bilateral lithiasis must be based upon the general status of the case; while in general the advice is valid to operate upon the better side first, it is not always feasible. Case No. 1 had bilateral stones and pyuria and a chronic cowperitis. As his symptoms were all referred to the left side, this was operated, though the poorer of the two. Subsequent examination of segregated urines showed the operated side free from pus. The opposite side is still to be operated. Case No. 2 showed a silent stone at the lower pole of the right kidney and a very large one in the left pelvis; also a markedly enlarged kidney and pelvis on this side. Cystoscopy was almost impossible on account of the gushes of pure pus from the left ureter. The diagnosis was bilateral nephrolithiasis with left pyonephrosis. The patient was urinating hourly day and night, his symptoms had been present for twenty-five years, and he was a nervous and physical wreck. Had the better side been operated, the opposite kidney would not have been adequate for carrying on the renal function. Upon exposure, the left kidney was found to be a huge pus sac filled with stones and it was removed. The patient is in splendid condition and will go on indefinitely with his one silent stone. He has a few blood cells and a good amount of albumen in his urine. Should it become necessary to operate upon his one remaining kidney he is a better risk now than before his first operation. It is interesting to note that two of his sisters in a family of nine have a history of calculi.

Case No. 4 is quite a fat man who has large stone shadows on both sides. He has a marked pyuria with moderate frequency. Judging from the pictures, there is a large amount of renal destruction on both sides and one would hesitate to interfere. He is fairly comfortable and reports occasionally for X-rays. The stones are increasing in size slowly.

Case No. 5 is interesting in that the patient came in originally in 1915, when a diagnosis of left renal calculus was made. He refused operation and was lost sight of until last week, when he came in again, this time complaining of pain on the left side, radiating to the right. Cystoscopy found the right catheter impeded about six centimeters above the uretero-vesical junction. The X-ray showed three shadows like a rosary at that point. There is also a shadow the size of a hazel nut in the pelvis of the same side. A large shadow completely fills the pelvis and calyces on the left side. There is an anuria on the right side and a pyuria on the left; attempts to dislodge the stones in the ureter show some success. If there is a real anuria present on the right side it will be essential to work quickly. An interesting complication is a skin disease which has accompanied his four attacks of typical colic. This varies from a simple peeling of his hands to a desquamation of almost his entire body.

Case No. 6 has a left nephrotomy in 1905, and though X-rays in 1915 showed large calculi in the right side and ureteral catheterization showed no urine on the left, the patient was quite comfortable at his last appearance.

The remaining cases present nothing of especial interest. Hollander¹⁰ accounts for the formation of bilateral calculi by a paralysis of the renal pelvis and ureter following injuries of the spinal cord. Careful study of our bilateral cases failed to elicit any history of trauma.

SUMMARY

1. Bilateral nephrolithiasis does not differ essentially in history and symptomatology from unilateral.

2. The taking of a careful history is the first essential to the proper study of the case.

3. The symptoms of renal calculus are frequently misinterpreted, hence the necessity of correlating all findings.

4. Pain is a constant symptom, varying from a dull ache to colic; radiation of pain is the most suggestive.

5. Frequency of urination was the most common symptom.

6. Physical examination is of most value in excluding other conditions.

7. Cystoscopic findings are not striking.

8. Function is usually depressed on the affected side.

9. The X-ray gives the best evidence, but is not infallible.

10. It is important to have proper preparation for X-rays and to take the entire urinary tract.

11. There is no objection to a pyelogram if the shadow casting fluid can be drained off.

12. In bilateral involvement, the better side is usually operated first, unless distressing symptoms are coming from the poorer side.

13. Patients with large calculi on both sides may do well if left alone.

14. The fact that some individuals are calculus formers suggests caution in operating and a guarded prognosis.

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URINARY INCONTINENCE AND ITS OPERATIVE REPAIR.*

By JAMES R. DILLON, M. D., San Francisco.
Instructor in Genito-Urinary Surgery, Stanford University Medical School.

Incontinence of urine results from inability of the sphincters to prevent the involuntary escape of urine from the bladder. There are a number of persons having varying degrees of urinary incontinence due to spinal cord diseases, tuberculosis and traumatic lesions, who are forced to

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wear a urinal on their person. The cystitis which usually accompanies these conditions with its complications and sequellae and the stench emanating from the urinal, impresses one with the miserable condition of these patients and the readiness with which they will submit to any procedure which offers some small hope of relief.

True incontinence has been classified by Guyon as follows:

- A. Without material lesions of the urinary tract.
 1. Incontinence from nerve lesions.
 2. Incontinence from nervous affections.
 3. Incontinence of children.
- B. With material lesions of the urinary tract.
 1. Without retention of urine.
 - a. Mechanical incontinence.
 - b. Incontinence of tuberculosis.
 - c. Traumatic incontinence.
 - d. Incontinence from urethral insufficiency.
 2. With retention of urine.
 - a. Incontinence of stricture.
 - b. Incontinence of enlarged prostate.

The four cases forming the subject of this report, according to their histories, were originally in the last group, but as a result of operative accidents in the attempted relief of their retention, they came under my care suffering from traumatic incontinence without retention of urine.

There are many reports on the treatment of incontinence with drugs, massage, electricity, dilations, and periurethral injections of paraffin and vaseline. Also epidural and spinal injections have been used. But all have more or less failed in the presence of organic disease.

The first operative procedure was reported by Gersuny in 1888, consisting in dissecting free the length of the urethra in the female and twisting it from a half to three quarters of a turn and suturing it in this position. Subsequent articles reported, in general, unsatisfactory results, because of sloughing of the urethra. In 1907, Young reported an original and successful operation on the male in which he sutured both internal and external sphincters which had been cut fifteen months previously during an external urethrotomy. In the discussion of Young's paper Kelly reported two cases in which he had successfully performed similar operations on the sphincter at the neck of the bladder through the vagina in the female.

In 1908, Eckstein reported a case of Tabes and hypertrophied prostate with retention and dribbling in which he did a suprapubic cystotomy establishing a fistula in which a retaining catheter was worn, controlled by a clamp and carried in the pocket of a belt. Similar operations have been done on both the male and female by closing the urethra by a plastic operation, or a flap and valve operation through the perineum or vagina and establishing suprapubic drainage. These patients washed their own bladders once or twice a day and visited their physician every two weeks to have the retaining catheter changed and cleaned. In 1911, Squier reported a case in which he did a successful "urethroplastic operation," dissecting

out a large sac from the posterior urethra forming a new urethral floor, and closing the muscles over it. Kelly in 1914, and Young in 1919, reported further successes of their operations.

There is conflicting testimony as to the comparative value of the two sphincters in the control of micturition. Young states that after perineal prostatectomy, before the wound heals and while urine comes out of the urethra back of the external sphincter, the patient is able to control his urine, showing the internal sphincter is sufficient to prevent incontinence. He also quotes Freyer's autopsy reports on cases of previous suprapubic prostatectomies in which micturition has been normal, but in which the internal sphincter was greatly dilated, showing that it was not entirely necessary to prevent incontinence.

A careful cystoscopic and endoscopic study was made of the cases reported in this article to determine their exact condition, and the site of the injury was seen in all except the case of tuberculosis. At operation it was found that the space between the ruptured ends of the muscles was filled with scar tissue sufficient to allow the sphincters to stand open. In the tabetic and tubercular cases where there was complete incontinence, the bladder wall and also the perineal muscles were found markedly atrophied, of a very soft and friable nature and very difficult at times to suture. In the other two cases where there was slight control, the muscles were in a much healthier and more normal state and gave successful and gratifying results.

Case 1. C. B., No. 42485, German, Age 59. Entered San Francisco Hospital October 6, 1919. Complaint, incontinence of urine. Family history negative. Past history negative except for left nephrotomy in 1893, for removal of kidney stone. Present illness, in May 1918, a perineal prostatectomy was done resulting in a perineal fistula persisting until three months ago. Also if he held his urine over fifteen to thirty minutes he began to dribble.

Examination: Fairly well developed and nourished. Argyle Robertson pupils. Healed left nephrotomy scar. Reflexes present and active. Genitalia normal. Healed perineal scar from prostatectomy wound. Cystoscopic and urethroscopic examination: Entered easily, no residual, bladder capacity twenty-one ounces. The internal sphincter was somewhat relaxed due to a shallow cleft on the right side of a small median bar, apparently the torn internal sphincter. There was a depression just inside the membranous urethra, apparently the urethral orifice of the recent perineal fistula, posterior to which was an overhanging process. The membranous urethra was very much relaxed. Tissues soft.

Operation October 14, 1919, under two grains of tropocaine spinal anesthesia. Inverted V incision made and the scar tissue of the previous prostatectomy dissected out down to the urethra which held a sound. The dissection was carried until the ends of healthy perineal and urethral muscles were found, without opening the urethra. The urethral muscles were brought together and

then the perineal muscles sutured about the urethra, thus making a tight sphincter. The wound was closed without drainage. The internal sphincter was not touched in this case. Recovery uneventful. One month later he was seen and a 24 Fr. sound easily passed. He stated that he was holding his urine two or three hours, and had full control.

Case 2. A. G., No. 42110. German, Age 79. Tinsmith. Complaint: Complete urinary incontinence. Family and past histories negative. Present illness: Started two years previously with frequency of urination, and at times hesitancy and dribbling. Suprapubic prostatectomy done six months previously in Los Angeles, and has had complete incontinence since.

Examination: Argyle Robertson pupils. Lungs, impaired resonance in both. Achilles tendon reflexes absent. Left patellar diminished. Spinal fluid under tension, cell count 36, Wassermann XXX. Blood Wassermann XXX. Genitalia: Erosion of glans penis and prepuce from maceration in urine. No evidence of prostate by rectal palpation. Left vesicle palpable. No residual urine on catheterization. Bladder capacity, less than 100 cc. caused great distress.

Cystoscopic and urethoscopic examinations: Entered easily, marked cystitis with ragged flakes of pus covering the entire bladder wall. The internal sphincter was torn and separated in the base of the urethral orifice. The prostatic urethra was very irregular in outline and scarred. The external sphincter was greatly relaxed, standing open.

This patient was treated for over a month with bladder irrigations, tonics, and antiluetic measures, without improvement. He continually begged for something to be done to relieve his misery, and after several urethoscopic examinations, decided to attempt to repair the internal sphincter and tighten the external sphincter.

Operation, October 25, 1919. Suprapubic cystotomy done and internal orifice exposed. The floor of the urethral orifice was denuded of mucous membrane and the torn ends of the internal sphincter approximated and sutured with fine chromic gut. One half inch drainage tube sutured in. Inverted Y incision made in perineum exposing the bulbo-membranous urethra, and the external sphincter tightened by removing a portion and suturing together the ends. Perineal muscles closed over the urethra and the wound closed without drainage. Suction apparatus attached to suprapubic drain to keep bladder dry.

The bladder was very thin walled and friable, as were the tissues and muscles in the perineum. Forceps and hemostats would tear out on the least strain. The man had no resistance and there was no effort at healing, and he died one month after the operation.

In this case it would have been a better procedure to have followed Eckstein's method with a simple cystotomy and retaining catheter in the fistula, and gotten him up and around in a few days, and later obstructed the urethra by a plastic operation, through the perineum.

Case 3. F. G., No. 42437, Italian, Age 54. Entered October 6, 1919. Complaint: Incontinence of urine. Family history negative. Past history: Radical operation for carcinoma of the lip seven years previously. Present illness: Frequency, burning and pain in head of penis started two years ago. Frequency increased to every fifteen to thirty minutes. In January, 1919, he developed retention and a perineal prostatectomy was done in Stockton, resulting in complete incontinence through the penis when lying down and through a persisting perineal fistula when standing up. His testicles swelled up one month after the operation and have never gone down.

Examination: Marked pyorrhea. Rales and dullness in the apex of the right lung. Sputum negative at this time. Genitalia: Redundant prepuce irritated from dribbling urine; both epididymi enlarged, nodular and hard; right testis small and hard. Two fistulas in perineal wound. Left side of prostate apparently removed. Small mass in region of right lobe, hard, nodular, and infiltrated into the right vesicle.

Cystoscopic and urethoscopic examinations: Entered easily, practically no bladder capacity, mucous membranes somewhat inflamed, particularly around the left ureteral orifice. Posterior urethra rigid and board like, both sphincters standing open showing no contractility. Phthalein test: 30% from the right kidney, and 13½% from the left in half an hour. Acid fast bacilli in the bladder urine.

October 29, 1919, left nephrectomy done, kidney badly abscessed and destroyed.

November 4, 1919, bilateral epididymovasectomy done (Cabot's method) under spinal anesthesia. Pathological report, tuberculous.

November 11, 1919, under spinal anesthesia, inverted V incision made in perineum and fistulas dissected out down to the membranous and prostatic urethra. The sinuses were filled with soft granulation tissue making up more than half of the perineal body. Such a large cavity was present after the dissection, that no attempt was made to find healthy muscle through the thick scar which covered them; the urethral sinus was closed over a sound and the scar infiltrated perineal muscles sutured together with difficulty. A small drainage tube was left down to the urethra. Pathological report showed round celled infiltration and small tubercular abscesses. Suprapubic cystotomy done for drainage.

December 16, 1919, urine draining from both suprapubic and perineal wounds. December 31, 1919, X-Ray treatments started. In twelve days the suprapubic wound was practically closed and by the end of a month both wounds were closed. Forty-seven daily treatments given, omitting Sundays only, without burning. Notes made on February 19, and 23, 1920, state that the patient was up and about, and holding urine for a few minutes at a time.

Shortly after, his perineal wound broke open again, and as acid fast bacilli had been found in his sputum, he was transferred to the T. B. ward. Except for a greatly improved physical

condition, he has the same miserable urinary incontinence he had in the beginning. Perhaps, if the X-Ray therapy had been started earlier, both before the perineal repair operation, and immediately after it, there might have been more primary healing and a permanently closed perineum obtained.

Case 4. J. G., No. 43540, American, Age 44. Entered December 12, 1919. Complaint: Dizzy spells and urinary incontinence. Family history negative. Past history: Insomnia and chronic arthritis in all joints off and on for years. Dizzy spells and headaches for last six years relieved by digitalis and whisky. Pain in heart and swelling of the feet at times. Two Neisser infections, and has been treated for strictures since 1908.

Present illness: Had an external urethrotomy done in 1910, for his strictures. Has had dribbling since then, especially when asleep and when tired after working. Has worn a urinal and been told by several doctors that it was the only relief for him.

Physical findings: Heart absolute irregularity, rapid, weak pulse, no murmurs. Genitalia: Chronic epididymitis both sides. Urine clear. Number 30 Fr. sound easily to bladder. Prostate small, lobes nodular, base infiltrated into vesicles especially right. Prostatic sulcus deep. Cystoscopic and urethroscopic examination: Capacity 32 ounces; bladder wall and ureteral orifices normal. Neck of bladder regular in outline anteriorly, with a deep cleft in the floor of the urethra between the lateral lobes of the prostate. The cleft extends forward through the prostatic and membranous urethras, showing both sphincters had been cut. The sphincters did not close in the normal folds but remained relaxed and were sluggish. Varumontanum not seen.

December 9, 1919, Operation under two grains of tropocaine in spinal fluid. Suprapubic cystotomy: Denuded an area in the bladder neck covering the ends of the cut internal sphincter, and dissected out the scar tissue. Approximated the ends of the muscle with four fine chromic catgut sutures. Sewed in one half inch rubber drainage tube in the suprapubic wound. Injected one and one-half grains more of tropocaine in the spinal fluid, one hour and a half after the first injection. Put the patient in the lithotomy position and made an inverted Y incision in the perineum. The scar tissue was dissected out until the healthy muscle ends were found, without opening the urethra. The ends of the urethral and perineal muscles were approximated and the wound closed without drainage. Negative pressure apparatus applied to the suprapubic bladder tube to keep internal sphincter dry as possible.

In one month the wounds were healed and the patient was urinating normally, getting up once during the night. At the end of six weeks a 29 Fr. sound was passed and a cystourethroscopic examination made showing a median bar across the former cleft in the vesical orifice, and with normally functioning internal and external sphincters on withdrawing the urethroscope.

January 19, 1920, dismissed with urinary condition cured.

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INDUSTRIAL MEDICINE.*

By ROBERT T. LEGGE, M. D., F. A. C. S., University of California, Berkeley.

For the first time in the history of this society a new section on Public Health and Industrial Medicine makes its debut on the program as an important branch in the field of scientific medicine. These specialties should be devoted in their fullest measure to educational problems in preventive, industrial and socialized medicine, so as to offer to the general profession a knowledge of subjects that are correlated with medicine. The practicing physician trained in curative medicine deals entirely with the individual while the sanitarian, the industrial physician, or the social worker deals with the problems that confront the whole of the society. All factors in public health or social economics are fundamentally medical subjects, and consequently the profession should be continually informed of the advances made in these fields of research. Bernardino Ramazzini of the University of Padua, whose death occurred two hundred years ago, and probably the earliest teacher in the study of the diseases of artificers, is reputed to have said: "Man must work to live, and if the work itself brings death a vicious circle is created." This observer realized that nothing comes closer to actual humanitarianism than prophylaxis of the ills caused by special occupations. When the steam engine was invented, modern machinery was the result, and manufacturing became the foundation of commerce and industry. All efforts and skill in chemical and mechanical science were brought to bear to increase output and convert raw materials into finished products. The human machine element was lost sight of in this evolution for the supremacy of trade until lay workers connected with social agencies, statisticians in life insurance companies, and medical men became aroused by the spectacle of the human wastes, who met their early demise, or filled our institutions and hospitals.

The studies of occupational diseases and hygiene by such Europeans as Rambousek, T. M. Legge and Sir Thomas Oliver combined with the pioneers in the field in America, viz: Kober, Alice Hamilton, Gilman Thompson, Hayhurst and others are epoch making. The research in fatigue by Josephine Goldmark and Professor Lee, the compilation of mortality statistics from consump-

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